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PCT

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Toru SANO, et al.

Docket No: Q87545

Appln. No.: 10/532,978

Group Art Unit: 1753

Confirmation No.: 3025

Examiner: Not Yet Assigned

Filed: April 28, 2005


For: SEPARATION APPARATUS, METHOD OF FABRICATING THE SAME, AND ANALYTICAL SYSTEM

**SUBMISSION OF INTERNATIONAL PRELIMINARY
EXAMINATION REPORT (IPER)**

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

For the Examiner's convenience, enclosed herewith is a copy of the English translation of the International Preliminary Examination Report (IPER). It is assumed that copies of the cited references as required by §371(c) will be supplied directly by the International Bureau, but if further copies are needed, the undersigned will undertake to provide them upon request.

Respectfully submitted,


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WASHINGTON OFFICE

23373

CUSTOMER NUMBER

Date: December 2, 2005

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION OF TRANSMITTAL
OF COPIES OF TRANSLATION
OF THE INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY
(CHAPTER I OR CHAPTER II
OF THE PATENT COOPERATION TREATY)
(PCT Rule 72.2)

To:

HAYAMI, Shinji
Daikanyama TK Bldg. 1F
2-17-16, Ebisu-Nishi
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Date of mailing (day/month/year) 07 July 2005 (07.07.2005)	
Applicant's or agent's file reference NE-70122WO	IMPORTANT NOTIFICATION
International application No. PCT/JP2003/013852	International filing date (day/month/year) 29 October 2003 (29.10.2003)
Applicant NEC CORPORATION et al	

1. Transmittal of the translation to the applicant.

The International Bureau transmits herewith a copy of the English translation made by the International Bureau of the international preliminary examination report established by the International Preliminary Examining Authority.

2. Transmittal of the copy of the translation to the elected Offices.

The International Bureau notifies the applicant that copies of that translation have been transmitted to the following elected Offices requiring such translation:

CA, CN, EP

The following elected Offices, having waived the requirement for such a transmittal at this time, will receive copies of that translation from the International Bureau only upon their request:

US

3. Reminder regarding translation into (one of) the official language(s) of the elected Office(s).

The applicant is reminded that, where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report.

It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned (Rule 74.1). See Volume II of the PCT Applicant's Guide for further details.

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer Masashi Honda
Facsimile No.+41 22 740 14 35	Facsimile No.+41 22 338 70 10

Translation

PATENT COOPERATION TREATY

PCT/JP2003/013852



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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference NE-70122WO	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/JP2003/013852	International filing date (day/month/year) 29 October 2003 (29.10.2003)	Priority date (day/month/year) 30 October 2002 (30.10.2002)
International Patent Classification (IPC) or national classification and IPC G01N 35/08, 27/26, 30/48, 37/00, B01D 57/02, B81C 1/00		
Applicant NEC CORPORATION		

<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u>8</u> sheets, including this cover sheet.</p> <p><input type="checkbox"/> This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of <u> </u> sheets.</p>
<p>3. This report contains indications relating to the following items:</p> <p>I <input checked="" type="checkbox"/> Basis of the report</p> <p>II <input type="checkbox"/> Priority</p> <p>III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p>IV <input checked="" type="checkbox"/> Lack of unity of invention</p> <p>V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p>VI <input type="checkbox"/> Certain documents cited</p> <p>VII <input type="checkbox"/> Certain defects in the international application</p> <p>VIII <input type="checkbox"/> Certain observations on the international application</p>

Date of submission of the demand 29 October 2003 (29.10.2003)	Date of completion of this report 04 June 2004 (04.06.2004)
Name and mailing address of the IPEA/JP	Authorized officer
Facsimile No.	Telephone No.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/JP2003/013852

I. Basis of the report

1. With regard to the elements of the international application:*

- ☒ the international application as originally filed
- ☐ the description:
pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____
- ☐ the claims:
pages _____, as originally filed
pages _____, as amended (together with any statement under Article 19
pages _____, filed with the demand
pages _____, filed with the letter of _____
- ☐ the drawings:
pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____
- ☐ the sequence listing part of the description:
pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.
These elements were available or furnished to this Authority in the following language _____ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/fig _____

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rule 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/JP2003/013852

IV. Lack of unity of invention

1. In response to the invitation to restrict or pay additional fees the applicant has:

- ☐ restricted the claims.
- ☐ paid additional fees.
- ☐ paid additional fees under protest.
- ☐ neither restricted nor paid additional fees.

2. ☒ This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is

- ☐ complied with.
- ☒ not complied with for the following reasons:

SEE SUPPLEMENTAL SHEET

4. Consequently, the following parts of the international application were the subject of international preliminary examination in establishing this report:

- ☒ all parts.
- ☐ the parts relating to claims Nos. _____

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/JP 03/13852

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: IV. 3.

The inventions set forth in claims 1-17 and 19-26 are technically characterized in the provision of a means for retaining a specific component in a sample in a separation area, such as a collecting portion or a wide section, while the invention set forth in claim 18 does not have the same technical feature.

However, it was possible to carry out the search for claim 18 in conjunction with the search for claims 1-17 and 19-26, therefore no request was made for a reduction in claims or for payment of additional search fees.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/JP 03/13852

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-26	YES
	Claims		NO
Inventive step (IS)	Claims		YES
	Claims	1-26	NO
Industrial applicability (IA)	Claims	1-26	YES
	Claims		NO

2. Citations and explanations

Document 1: Sano, Baba, Iguchi, Iida, Kawaura, Sakamoto,
Dai 63 Kai Extended Abstracts; The Japan
Society of Applied Physics, Separate Vol. 3,
24 September 2002, page 1146 (25a-R-8)

Document 2: US 6027623 A (Toyo Technologies, Inc.), 22
February 2000

Document 3: JP 9-504362 A (British Technology Group USA
Inc.), 28 April 1997 & WO 94/029707 A1 & US
5427663 A & EP 711412 A & US 5837115 A & CA
2164720 A

Document 4: WO 2002/023180 A1 (Hitachi, Ltd.), 21 March
2002

Document 5: JP 2002-310992 A (Hitachi Electronics
Engineering Co., Ltd.), 23 October 2002

Document 6: JP 2002-55098 A (Nippon Columbia Co., Ltd.),
20 February 2002

Document 7: JP 2-112755 A (Fuji Photo Film Co., Ltd.), 25
April 1990

Document 8: JP 7-43344 A (The Institute of Physical and
Chemical Research), 14 February 1995

Document 1 sets forth a nanoscale bio element based
on the principle of size-exclusion chromatography
comprising a collecting portion with a compressing

structure using a plurality of pillar-shaped or hole-shaped nanoscale man-made structures. Therefore there is no particular difference between the invention set forth in document 1 and the invention set forth in claims 1 to 5.

In addition, document 1 indicates that separation is based on the principle of size-exclusion chromatography, therefore a person skilled in the art would be capable of constituting a means to retain a specific component in a sample, as set forth in claims 8, 9, and 13 to 16, as necessary.

Moreover, a microchip separation device comprising a channel having an opening on the surface of the substrate, a lid portion covering said channel, a sample introduction portion, sample separation portion and sample recovery portion; and an analysis system provided with said separation device and a detection portion, are known features not requiring examples to be listed.

It would therefore be easy for a person skilled in the art to conceive of the inventions set forth in claims 6, 7, 19 and 20 in the light of document 1 and said known features.

Document 3 (see page 24, line 13 to page 25, line 5; fig. 7 in particular) sets forth a separation device, wherein by positioning obstacles that become larger as distance increases in the downstream direction of the channel, on the upstream side small samples are collected by the small obstacles, while large samples pass by the small obstacles, and on the downstream side both small and large samples are collected by the large obstacles. Document 3 also sets forth a separation device wherein the collecting portions of the compressing structure are constituted using nanoscale man-made structures, and smaller molecules are collected more easily.

It would therefore be easy for a person skilled in the art to conceive of the invention set forth in claims 10 to 12 in the light of documents 1 and 3.

Document 2 sets forth a separation device wherein by positioning a plurality of obstacles in the channel, differences in the dispersion velocity according to molecule size are used to have smaller molecules collected by the obstacles. Document 2, in the same way as document 3, sets forth a separation device wherein collecting portions with a compressing structure are constituted using nanoscale man-made structures, and smaller molecules are more easily collected. Documents 2 and 3 do not collect larger molecules based on the principle of separation by gel electrophoresis using gel which has been laid down uniformly, and it is not clear whether the collecting portions set forth in the claims of this application operate based on the principle of size-exclusion chromatography.

Document 4 sets forth a feature wherein an external force (an electric field) is applied in the width direction of the channel in an effort to increase the collection rate. In addition, in the art of gel electrophoresis, it is a known technique to apply an electric field in the width direction of a channel in order to increase the collection rate (see documents 7 and 8, for example).

It would therefore be easy for a person skilled in the art to conceive of the invention set forth in claim 17 in the light of documents 1 and 4 and said known technique.

Document 5 (see paragraphs [0014] to [0016] in particular) sets forth a separation technique wherein a plurality of devices comprising channel and separation

areas are provided, and the voltage applied in the lengthwise direction of the channel is made variable.

Therefore it would be easy for a person skilled in the art to conceive of the invention set forth in claim 18 in the light of documents 1 and 5.

In the inventions set forth in claims 21 and 22 it is not clear that the collecting portions are made to curve by means of oxidizing concavities and pillar-shaped bodies, and the use of semiconductor manufacturing techniques and the formation of oxide films on protrusions and recessions formed on the surface of a silicon substrate are common practices in methods to produce microchips (see document 4 (fig. 5) and document 6 (paragraph [0024], for example).

It would therefore be easy for a person skilled in the art to conceive of forming an oxide film on protrusions and recessions formed on the surface of a silicon substrate using semiconductor manufacturing techniques as set forth in claims 21 and 22, in the light of document 1 and the aforementioned matter.

Document 6 (see paragraphs [0026] to [0035] and fig. 3 in particular) sets forth a feature wherein a die is used in a method for manufacturing microchips.

It would therefore be easy for a person skilled in the art to conceive of the invention set forth in claims 23 to 26 in the light of documents 1 and 6.